

Independent Events

- Two or more events. (compound events.)
- outcome of 1st event does NOT affect outcome of other event

To find the probability $P(A \text{ and } B) = P(A) \cdot P(B)$
(multiply the 2 probabilities)

Example: When spinning each spinner once:

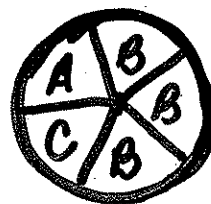
$$P(1 \text{ and } A) = P(1) \cdot P(A)$$

$$\frac{1}{4} \cdot \frac{1}{5} = \left(\frac{1}{20}\right)$$



$$P(2 \text{ and } B) = P(2) \cdot P(B)$$

$$\frac{1}{4} \cdot \frac{3}{5} = \left(\frac{3}{20}\right)$$



$$P(\text{even \# and a vowel}) = P(\text{even \#}) \cdot P(\text{vowel})$$

$$\frac{P(2,4)}{P(A)} \quad \frac{2}{4} \cdot \frac{1}{5} = \frac{2}{20} = \left(\frac{1}{10}\right)$$

$$\frac{1}{2} \cdot \frac{1}{5} = \frac{1}{10}$$

Dependent Events

- Two or more events
- Outcome of one event DOES affect outcome of other event.

Multiply probability of 1st event, then find probability of 2nd event and multiply these.

Example: 3 red marbles, 2 white marbles, and 4 blue marbles. Once a marble is selected, it is not replaced.

$$P(\text{red, then white}) \quad P(\text{red}) \text{ on 1st pick} = 3/9 = 1/3$$

$$P(\text{white}) \text{ on 2nd pick} = 2/8 = 1/4$$

$$\frac{1}{3} \cdot \frac{1}{4} = \frac{1}{12}$$

$P(\text{red, red})$
assume 1st
picked out
is red

$$P(\text{red}) \text{ on 1st pick} = 3/9 = 1/3$$

$$P(\text{red}) \text{ on 2nd pick} = 2/8 = 1/4$$

$$\frac{1}{3} \cdot \frac{1}{4} = \frac{1}{12}$$

$$P(\text{red, white, blue}) \quad P(\text{red}) \text{ on 1st pick} = 3/9 = 1/3$$

$$P(\text{white}) \text{ on 2nd pick} = 2/8 = 1/4$$

$$P(\text{blue}) \text{ on 3rd pick} = 4/7$$

$$\frac{1}{3} \cdot \frac{1}{4} \cdot \frac{4}{7} = \frac{4}{84} = \frac{1}{21}$$